SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

ARTICLES COMPRISING A FIBER-REINFORCED THERMOPLASTIC POLYMER COMPOSITION

This invention relates to a method to make a fiber-reinforced thermoplastic polymer composition comprising an elastomer and fabricated articles therefrom.

Molded articles comprising thermoplastic polymers, in particularly propylene polymers, find wide use in a large variety of applications, for example fabricated articles in automobiles, home appliances, electronic housings, furniture, floor coverings and wall coverings.

Physical property requirements for such articles are varied and application dependent. It is well-known to this art that thermoplastic polymers can contain non-polymeric materials as fillers, in order to alter certain of their properties. Thus, various mineral or inorganic fillers can be used in order to change one or more mechanical property of a thermoplastic polymer, such as coefficient of linear thermal expansion; modulus; impact strength, especially low temperature impact strength; tensile strength; flexural strength and resilience.

The process of forming a sheet of reinforced thermoplastic material, such as glass fiber-reinforced polypropylene, is well known. For example, the U.S. Pat. No. 4,439,387 shows a method of manufacturing a composite reinforcing structure by extruding fluid thermoplastic resin through an elongated die simultaneously with introducing a plurality of continuous fiber reinforcing strands into the die. However, the resulting composite demonstrates anisotropic mechanical properties. Improved performance is achieved by adding randomly oriented fibers and/or additional fillers.

Typically, molders of fabricated articles formed of reinforced thermoplastic material purchase the material from a manufacturer in a desired preform such as a sheet or a mat. The mat can be formed of glass fibers and layered in a thermoplastic resin such as polypropylene. The molder reheats the preform before inserting it into a molding machine to compression mold the desired part. However, such a procedure has many disadvantages including the inability to quickly change material composition and preform shape when required.

A method to compound a reinforced thermoplastic material in a continuous process, but limited to compression molded articles is taught in U.S. Patent No. 5,401,154. However, the process is not cost effective as it runs at low output rates and requires

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/30267

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B29C47/00 B29C47/10 B29C45/54 B29C31/04 B29C47/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B29C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
PAJ, WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 424 020 A (MATUBARA SHIGEYOSHI ET AL) 13 June 1995 (1995-06-13) column 1, line 16 - line 19 column 3, line 44 - line 54 column 4, line 47 - line 51 column 5, line 1 - line 15 claims; figures ---	1,4, 6-13, 15-17
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
30 January 2004	05/02/2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Jensen, K

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INTE[redacted]TIONAL SEARCH REPORT

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